[57] **ABSTRACT**

A system for automatically encrypting and decrypting data packet sent from a source host to a destination host across a public internetwork. A tunnelling bridge is positioned at each network, and intercepts all packets transmitted to or from its associated network. The tunnelling bridge includes tables indicated pairs of hosts or pairs of networks between which packets should be encrypted. When a packet is transmitted from a first host, the tunnelling bridge of that host's network intercepts the packet, and determines from its header information whether packets from that host that are directed to the specified destination host should be encrypted; or, alternatively, whether packets from the source host's network that are directed to the destination host's network should be encrypted. If so, the packet is encrypted, and transmitted to the destination network along with an encapsulation header indicating source and destination information: either source and destination host addresses, or the broadcast addresses of the source and destination networks (in the latter case, concealing by encryption the hosts' respective addresses). An identifier of the source network's tunnelling bridge may also be included in the encapsulation header. At the destination network, the associated tunnelling bridge intercepts the packet, inspects the encapsulation header, from an internal table determines whether the packet was encrypted, and from either the source (host or network) address or the tunnelling bridge identifier determines whether and how the packet was encrypted. If the packet was encrypted, it is now decrypted using a key stored in the destination tunnelling bridge's memory, and is sent on to the destination host. The tunnelling bridge identifier is used particularly in an embodiment where a given network has more than one tunnelling bridge, and hence multiple possible encryption/decryption schemes and keys. In an alternative embodiment, the automatic encryption and decryption may be carried out by the source and destination hosts themselves, without the use of additional tunnelling bridges, in which case the encapsulation header includes the source and destination host addresses.